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What is claimed is

1. A projection tube comprising a panel which forms a phosphor screen on an inner surface thereof, a funnel, a neck portion and a stem portion which seals the neck portion, wherein

the neck portion includes a first neck portion which constitutes a portion connected to the funnel and has a first neck outer diameter, and a second neck portion which accommodates an electron gun which emits a single electron beam toward the phosphor screen and has a second neck outer diameter,

the first neck outer diameter is set smaller than the second neck outer diameter,

the electron gun includes a main lens which is constituted of a final electrode and a focus electrode which has a portion thereof inserted into the inside of the final electrode,

the final electrode has a large-diameter portion and a portion whose diameter is gradually decreased toward the phosphor screen, and

a high voltage which is applied to the final electrode is set to equal to or more than 25 KV.

2. A projection tube according to claim 1, wherein a neck diameter of the second neck portion is set to equal to or more than 36.5 mm.

3. A projection tube according to claim 1, wherein said final electrode is constituted of a second anode and a shield cup.

4. A projection tube according to claim 3, wherein a neck diameter of the second neck portion is set to equal to or more than 36.5 mm.

5. A projection tube according to claim 3, wherein an inner diameter

of the shield cup is gradually decreased toward the phosphor screen.

6. A projection tube according to 5, wherein a neck diameter of the second neck portion is set to equal to or more than 36.5 mm.

7. A projection tube according to claim 3, wherein the shield cup includes a large-diameter portion and a small-diameter portion and a main lens is constituted of the large-diameter portion of the shield cup and the focus electrode.

8. A projection tube according to 7, wherein a neck diameter of the second neck portion is set to equal to or more than 36.5 mm.

9. A projection tube according to claim 1, wherein a neck graphite for supplying the high voltage is formed on an inner wall of the first neck portion and an inner wall of the second neck portion, and a bulb spacer contact which electrically connects the neck graphite and the final electrode is mounted on the large-diameter portion of the final electrode.

10. A projection tube according to claim 9, wherein the bulb spacer contact is mounted on the second anode.

11. A projection tube according to claim 1, wherein a neck diameter of the first neck portion is set to equal to or less than 29.1 mm.

12. A projection tube according to claim 1, wherein a neck diameter of the first neck portion is set to 29.1 mm and a neck diameter of the second neck portion is set to 36.5 mm.

13. A projection tube according to claim 1, wherein the high voltage is set to 30 kV or more.

14. A projection tube comprising a panel which forms a phosphor screen on an inner surface thereof, a funnel, a neck portion and a stem

portion which seals the neck portion, wherein  
the neck portion includes a first neck portion which constitutes  
a portion connected to the funnel and has a first neck outer diameter, and  
a second neck portion which has a second neck outer diameter,

the first neck outer diameter is set smaller than the second neck  
outer diameter,

a main lens portion of an electron gun which generates a single  
electron beam is disposed in the second neck portion,

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the main lens is constituted of a final electrode and a focus  
electrode which has a portion thereof inserted into the inside of the final  
electrode,

the final electrode includes a large-diameter cylindrical  
portion which constitutes a portion in which the focus electrode is inserted,  
a small-diameter cylindrical portion of the phosphor screen side and a  
portion whose diameter is gradually decreased toward the phosphor screen,  
and

a high voltage which is applied to the final electrode is set to  
equal to or more than 25 KV.

15. A projection tube according to claim 14, wherein the small-  
diameter cylindrical portion of the final electrode is disposed in the  
inside of the first neck portion.

16. A projection tube according to claim 14, wherein a neck graphite  
which supplies the high voltage is formed on an inner wall of the first  
neck portion and a bulb spacer contact which electrically connects the neck  
graphite and the final electrode is mounted on the small-diameter

cylindrical portion of the final electrode.

17. A projection tube according to claim 14, wherein the neck graphite is not provided to an inner wall of the second neck portion.

18. A projection tube according to claim 14, wherein a flange defining a diameter which is further smaller than an inner diameter of the small-diameter cylindrical portion is formed on a phosphor-screen-side end of the small-diameter portion of the final electrode.

19. A projection tube according to claim 14, wherein a cylindrical burring is formed on the inner side of the small-diameter cylindrical portion of the final electrode such that the cylindrical burring is extended from a phosphor-screen-side end portion toward a focus electrode side.